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Cross-country comparison of proportion of alcohol consumed in harmful drinking occasions using the International Alcohol Control Study

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Abstract

Introduction and Aims. *This study examines the proportion of alcohol markets consumed in harmful drinking occasions in a range of high-, middle-income countries and assesses the implications of these findings for conflict of interest between alcohol producers and public health and the appropriate role of the alcohol industry in alcohol policy space.* ***Design and Methods.*** *Cross-sectional surveys were conducted in 10 countries as part of the International Alcohol Control study. Alcohol consumption was measured using location- and beverage-specific measures. A level of consumption defined as harmful use of alcohol was chosen and the proportion of the total market consumed in these drinking occasions was calculated for both commercial and informal alcohol.* ***Results.*** *In all countries, sizeable proportions of the alcohol market were consumed during harmful drinking occasions. In general, a higher proportion of alcohol was consumed in harmful drinking occasions by respondents in the middle-income countries than respondents in the high-income countries. The proportion of informal alcohol consumed in harmful drinking occasions was lower than commercial alcohol.* ***Discussion and Conclusions.*** *Informal alcohol is less likely to be consumed in harmful drinking occasions compared with commercial alcohol. The proportion of commercial alcohol consumed in harmful drinking occasions in a range of alcohol markets shows the reliance of the transnational alcohol corporations on harmful alcohol use. This reliance underpins industry lobbying against effective policy and support for ineffective approaches. The conflict of interest between the alcohol industry and public health requires their exclusion from the alcohol policy space.* [Pham CV, Casswell S, Parker K, Callinan S, Chaiyasong S, Kazantseva E, Meier P, MacKintosh A-M, Piazza M, Gray-Phillip G, Parry CDH. Cross-country comparison of proportion of alcohol consumed in harmful drinking occasions using the International Alcohol Control Study. *Drug Alcohol Rev* 2018;37:S45–S52]

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Introduction

The common response of the alcohol industry to proposed effective policy restrictions on alcohol is to frame the issue of alcohol problems as related primarily to the minority of heavy alcohol users and shift focus away from the majority of drinkers [1].

This is a pervasive framing used by alcohol industry organisations in many countries, including those participating in this study [e.g. 2–4] and the framing is used to provide a justification for arguments against effective public policies on the grounds they may impact 'moderate' or 'responsible' drinkers. The onus is then shifted by the alcohol industry onto the drinker themselves to drink responsibly and avoid alcohol related harm [5]. The industry's past activities as part of this framing have been assessed as predominantly without scientific basis for effectiveness and most were found to deal with popular but ineffective strategies such as information campaigns and designated driver programs and, in some cases, were likely to increase youth exposure to alcohol marketing or to encourage alcohol use [6].

It is implied in the industry's engagement in this kind of initiative and in policy development that they are a partner in efforts to reduce harm and they can afford to partner to reduce harmful alcohol consumption because only a minority of drinkers are heavy consumers; if these people can be changed to moderate drinkers it will be a win–win situation for both the alcohol producers and society at large. However, the industry response must also reflect the legal requirement of corporations to their shareholders to protect and increase their profits. The corporate social responsibility activity of the global transnational alcohol corporations must be aligned with the shareholders' interests [7,8]. As Margaret Chan, past Director General of the World Health Organization (WHO) stated: 'efforts by industry to shape the public health policies and strategies that affect their products' should be resisted; 'when industry is involved in policy-making, rest assured that the most effective control measures will be downplayed or left out entirely' [9].

A further common focus for the transnational alcohol corporations is on non-commercial alcohol, which is defined as including informal or traditionally produced alcohol and given some prominence in their social media communications and as an aspect of risky drinking [10].

This paper uses data from the International Alcohol Control (IAC) study to investigate the legitimacy of these industry framings and suggest alternative framings in the context of expanding interest in the commercial determinants of health [11] and given the crucial importance of 'argumentative framing' for policy development [12].

Alcohol markets in different country settings

This paper includes data from 10 countries participating in the International Alcohol Control (IAC) study; five high-income countries (Australia, England, Scotland, New Zealand and St Kitts and Nevis) and five middle-income countries (Thailand, South Africa, Peru, Mongolia and Vietnam). These countries all differ in terms of population size and gross domestic product (GDP) per capita (see Table 1). In addition, as reported by the Global Information System on Alcohol and Health (GISAH), these countries differ in terms of prevalence of alcohol use by men and women, and aggregate levels of consumption.

Most of the high-income countries (Australia, England, Scotland and New Zealand) have a higher prevalence of alcohol use and consequently a higher level of per capita adult consumption, both men and women, in comparison to the middle-income countries. St Kitts and Nevis moved from middle-income to high-income status in 2013 and is closer to middle-income levels. Peru and especially South Africa have high levels of per capita consumption according to GISAH data relative to their GDP per capita. Thailand is an upper middle-income country with lower levels of prevalence, particularly among women. South Africa and Vietnam had relatively high proportions of the market made up of informal alcohol in 2008 to 2010 [13].

International alcohol control study

The IAC study is designed to collect data on alcohol consumption and policy-relevant behaviours in a comparable way in high- and middle-income countries. The study began in 2011 as collaboration between five countries and has since grown to include 12 countries (of which 10 countries had collected data that were available to be included in the current study). The IAC study provides the opportunity for a quasi-experimental design involving cross-country comparison of policy changes and is modelled on the International Tobacco Control study (for further details see Casswell et al., 2012 [14]).

Cross-country research into alcohol is complex because alcohol beverages (including informal alcohol), strengths and container sizes differ. The framework used in the IAC study for collecting consumption data has been found to provide comparable measures across countries. The IAC study measures alcohol consumed in different drinking locations along with the frequency of consumption at each of these locations. The location and beverage choice/strength/container sizes (including informal alcohol) were adapted to be relevant to each country and in this way the IAC framework provided comparable

Table 1. *Population size, GDP per capita, prevalence of alcohol use and aggregate levels of alcohol consumption across countries*

				Prevalence (%) of alcohol use: percentage of people consuming alcohol in the past 12 months (2010 data)[b]			Total per capita (15+) consumption (litres of pure alcohol) (2008–2010)[b]	
		Total population[a] (millions)	GDP per capita PPP (current international $)	Female	Male	Both	Total	Unrecorded
High income								
Australia	2013	23.1	$45 668	80.1	88	84	12.2	1.8
England[3]	2013	53.9	$39 016	81	87	83.9	11.6	1.2
Scotland[c]	2013	5.3	$39 016	81	87	83.9	11.6	1.2
New Zealand	2011	4.4	$32 986	74.5	84.8	79.5	10.9	1.6
Saint Kitts and Nevis	2015	0.1	$25 681	31.5	54	42.5	8.2	0.5
Middle income								
Thailand	2012	67.8	$14 714	14.9	45.4	29.7	7.1	0.7
South Africa	2014	54.1	$13 127	26.3	56.3	40.6	11	2.9
Peru	2015	31.4	$12 529	44	66.9	55.4	8.1	2
Mongolia	2013	2.9	$11 093	35.1	56.5	45.7	6.9	2
Vietnam	2014	90.7	$5657	28.6	48.5	38.3	6.6	4.6

[a]World Bank Databank. [b]World Health Organization, Global Information System on Alcohol and Health. [c]The data on gross domestic product and alcohol consumption of UK applied for both England and Scotland.

measures across countries with different alcohol markets. The beverage- and location-specific measures have been found to account for a relatively very high proportion of the alcohol available for consumption in countries where data to assess coverage was available: approximately 86–90% of the alcohol available for consumption in and Australia and New Zealand, respectively [15–17].

While previous research has tended to focus on the individual when examining the quantities of alcohol consumed in harmful drinking occasions, this analysis examines the litres of alcohol consumed during harmful drinking occasions at the level of the alcohol market. The aim of the present study is to examine the proportion of the alcohol market consumed in harmful drinking occasions in countries with different prevalence and per capita alcohol levels. We also analyse the proportion of commercial and informal consumed in harmful drinking occasions where informal alcohol use is reported.

Heavy drinking occasions and harm

Alcohol accounts for 3.3 million deaths globally and 5.1% of the global burden of disease and injury [13]. The WHO estimates 16% of drinkers worldwide engage in heavy episodic drinking and 7.5% have at least one heavy drinking episode per month [13]. The WHO defines heavy episodic drinking as drinking at least 60 g or more of pure alcohol on at least one occasion in the past 30 days [18]. Heavy drinking occasions have been linked to an increased risk of injury from violence [19], ischemic heart disease [20,21], and other diseases [22] and a higher risk of mortality [23]. Heavier drinking occasions have also been shown to be causally related to intimate partner violence (particularly men against women) [24–26] and to significantly increase the risk of traffic crash and pedestrian injury [19,27]. The amount of alcohol consumed in heavy drinking occasions is therefore an important predictor of alcohol-related harm and a target for public health policy.

Harmful drinking occasions

The threshold for harmful drinking occasions was set high in this study: typical quantities consumed in a drinking occasion of eight plus drinks of 15 mL/12 g of absolute alcohol for men and six plus drinks for women. These were quantities consumed in a typical drinking occasion as reported by the respondents and so the level defined as harmful use of alcohol in this analysis is considerably higher than the definition of heavy episodic drinking as defined by the WHO.

Method

Sample

Cross-sectional population surveys were conducted in each of the 10 countries between 2011 and 2016.

Sampling methods were designed to obtain a random representative sample and each country utilised the sampling frame that was most appropriate in their context. Multi-stage sampling of geographical units was used to represent three provinces in Vietnam, five provinces in Thailand including Bangkok, two districts in Ulaanbaatar, Mongolia, Saint Kitts and Nevis, Peru (Los Olivos district, Lima) and South Africa [Tshwane metropolitan municipality (covering Pretoria)]. In New Zealand, a national stratified sample of residential landline numbers comprised the sample frame, including published and unpublished landline numbers and this was the same in England and Scotland. In Australia a national sample frame of residential landline (stratified) and cell phone numbers was used. Interviews were conducted via computer-assisted interviewing. This was done by phone in Australia, England, Scotland and New Zealand and face-to-face in Mongolia, Saint Kitts and Nevis, South Africa, Thailand and Vietnam using hand-held android tablets.

Once a household was confirmed to be residential, numerous call-backs were made at different times of the day and days of the week in an attempt to reach a member of the household. When contact was made, all individuals of the household were enumerated and one selected at random to participate in the study. If a respondent refused to participate, another was selected at random from a different household. Eligibility was established (drinking in the last 6 months) via a screening interview. Additional screening criteria were used in Australia to generate a larger proportion of heavier drinkers (defined as 5+ drinks at least once a month), however, survey weights are used to correct for this in presented results. To acknowledge the time respondents gave to the study, a range of gifts/vouchers were given to respondents in England, Mongolia, New Zealand, Scotland, St Kitts and Nevis and South Africa, Thailand and Vietnam. All surveys were conducted by trained interviewers.

The response rates for each country were as follows: Australia 37%, England 16%, Scotland 19%, New Zealand 60%, St Kitts and Nevis 60%, Thailand 93%, South Africa 78%, Peru 82%, Mongolia 44% and Vietnam 99%; The response rates were calculated using at least American Association for Public Opinion Research formula #3 [28].

Questionnaire

The questionnaire was developed in consultation with UK, Thai, Korean and New Zealand researchers and was translated, back-translated and administered in the local language of each country. In addition to consumption measures, the questionnaire contained measures such as prices paid, time of purchase, and exposure and resonance of marketing that are not used in this analysis.

Harmful drinking occasions

Consumption data was collected through location and beverage-specific measures. Respondents were asked to report on their drinking at a number of specified on- and off-license premises, as well as any unspecified locations. To record the typical quantity of alcohol consumed, participants were asked to state the type of beverage(s), number of drinks and the type and size of the container (e.g. 1125 mL bottle of spirits) they typically consumed at each location. Frequency of drinking response options ranged from 'Never at that location' to '2 or more times daily'. The locations and beverages measures were adapted to reflect the full range of options available in each country and included informal and illegal beverages. This information was used to calculate the total litres of absolute alcohol (volume) consumed in each alcohol market (country).

Respondents were asked to report on the typical quantities consumed in each drinking location. Typical drinking at each of the locations relevant to the respondent was determined as either being a harmful drinking occasion or non-harmful drinking occasion. A harmful drinking occasion was defined as any occasion where males consumed eight drinks or more or females consumed six drinks or more at each location, where a drink was defined as 15 mL absolute alcohol. Litres of absolute alcohol consumed in harmful drinking occasions were taken as a proportion of absolute alcohol consumed at each location.

Informal alcohol

Consumption data pertaining to informal alcohol was collected as part of the IAC consumption location and beverage-specific measures. As beverage types were adapted to reflect those available in each country, informal beverages were recorded specifically by type to ensure they were captured. Informal alcohol was defined using the definition in the *WHO Global strategy to reduce the harmful use of alcohol* [29]. Informally produced alcohol means alcoholic beverages produced at home or locally by fermentation and distillation of fruits, grains, vegetables and the like, and often within the context of local cultural practices and traditions [29].

Analysis

Sample sizes were: Australia 1556, England 1700, Mongolia 847, New Zealand 1965, Peru 1787, Scotland 1675, South Africa 1002, St Kitts and Nevis 1279, Thailand 2335 and Vietnam 2005. As one person was selected per household, unequal probability of respondent selection was corrected for. Some countries also calculated post-stratification weights where appropriate and data were available to do so and these were used in this analysis (Australia, England, Scotland and New Zealand). Australia oversampled heavy drinkers and, as mentioned earlier, weights were used to account for this. The remaining country data sets were unweighted.

All statistical analyses were carried out using SAS 9.2 using data from participants aged between 16 and 65 years.

Litres of absolute alcohol consumed in harmful drinking occasions in each country were summed. From this, the overall proportion of alcohol consumed in harmful drinking occasions as a proportion of the total alcohol consumed was determined.

Ethical approval and declaration of conflict of interest

Ethical approval to conduct the IAC study was obtained by each country. All co-investigators had no conflict of interest in terms of links or funding from commercial interests involved in producing, marketing and distributing alcohol at the time of joining the study. Parental/guardian permission to interview respondents under 18 years was sought in all countries excluding New Zealand, England and Scotland where ethical approval permitted interview of those 16–17 years without parental consent.

Results

Proportion of commercial alcohol in harmful drinking occasions

Figure 1 shows the proportion of absolute alcohol (litres) consumed in harmful drinking occasions across 10 countries. In almost all of the countries, the majority of alcohol was consumed during harmful drinking occasions, with New Zealand and England just under half and Australia and Scotland just over. St Kitts and Nevis was 57%, and Peru and Vietnam also reported about half of the alcohol market consumed in harmful drinking occasions. The other middle-income countries reported higher proportions in harmful drinking occasions and South Africa was extremely high (93%). In Mongolia, and Thailand, the percentage was 62%.

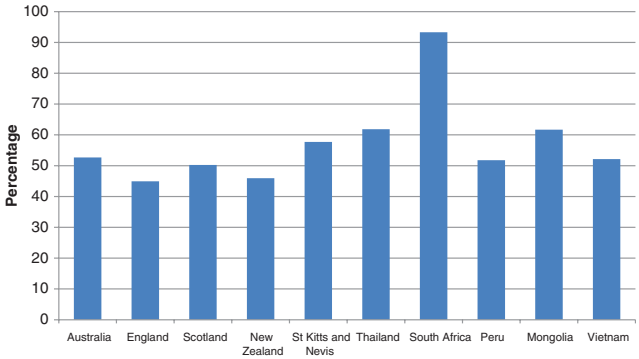

Figure 1. *Overall percentage of alcohol consumed (litres) in harmful drinking occasions across countries. * South Africa, Peru, Mongolia and Vietnam samples were sub-national.*

Informal alcohol

Respondents reported use of informal alcohol in Mongolia, Peru and Vietnam. In Peru and Mongolia the proportion of the alcohol consumed in each country in the form of informal beverages was very small: 1% and 2%, respectively. In Vietnam it was much larger (69%).

Harmful use of informal alcohol. Figure 2 shows the proportion of informal and commercial alcohol consumed in harmful drinking occasions. In all countries, the proportion of informal alcohol consumed in harmful drinking occasions was lower than the proportion of commercial alcohol. These were: 38.5% of informal alcohol used in harmful drinking occasions in Mongolia, 11.3% in Peru and the highest proportion was Vietnam with 43.6%. The proportions of commercial alcohol consumed in harmful drinking occasions were statistically significantly higher than informal alcohol ($P < 0.001$).

Discussion

This paper reports the proportion of alcohol that is consumed in harmful drinking occasions in several IAC countries and differences between commercial and informal alcohol. In most of the high-income countries, the proportion of alcohol consumed in harmful drinking occasions was approximately half and in some middle-income countries it was greater. The findings in high-income countries are in keeping with previous research in Canada [30] and Australia [31]. The proportions consumed in heavy drinking

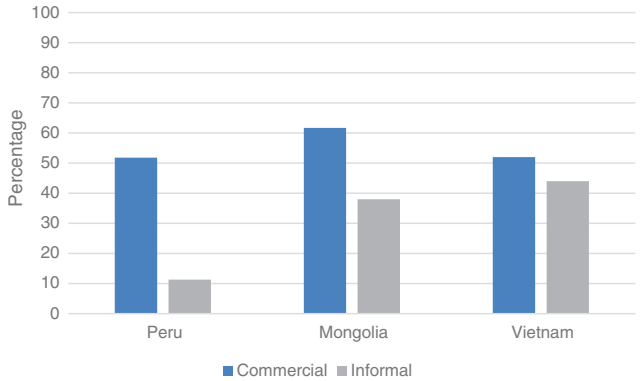

Figure 2. *Percentage of commercial vs. informal alcohol consumed (litres) in harmful drinking occasions across countries. * Peru, Mongolia and Vietnam samples were sub-national.*

occasions in South Africa were extremely high but in keeping with analyses of the conditions promoting increased alcohol consumption in Africa and the burden of disease and injury [32,33]. However, it must be noted the South African sample was drawn from the Tshwane province and is not necessarily representative of the entire nation.

The threshold for harmful drinking occasions was set very high in this study—8+/6+ on a typical drinking occasion—meaning the proportions reported are likely to be conservative estimates of the proportion of the alcohol market consumed in harmful drinking occasions.

A surprising finding was that less of the informal alcohol was consumed in harmful drinking occasions. Much of the sparse literature on informal alcohol relates to the implications for policy options which control availability and price [34] and the potential dangers of contaminants and lack of control over potency and this is something which is emphasised by commercial producers of alcohol [35]. A global review of the evidence on unrecorded alcohol (which includes informal) concluded ethanol was the most harmful ingredient of unrecorded alcohol, and health consequences due to other ingredients found in unrecorded alcohol were scarce [36]. However, there is a perception, as unrecorded alcohol is usually the least expensive form of alcohol available in many countries, that it may contribute to higher rates of chronic and irregular heavy drinking [36,37]. In this study we found the proportions of informal alcohol consumed in harmful drinking occasions was statistically significantly lower than commercial alcohol products. In a small scale study of informal alcohol use in Vietnam amounts reported and observed were not high [38] (and in a similar study in China reported amounts were similar to other alcohol beverage consumption [39]).

The very low levels of informal alcohol use reported in the samples in Peru and Mongolia, much lower than the estimates found in GISAH, may reflect the areas of the country in which the surveys were carried out, in both cases these were metropolitan areas. In South Africa, so few respondents reported informal alcohol use that they were not included in the analysis. Again this is contrast with GISAH figures and may reflect the urbanised areas of the country in which the surveying took place. However, it is also highly likely that the use of informal alcohol is reducing globally as younger cohorts of drinkers prefer the commercial alcohol brands increasingly widely available [38,39].

The findings of this study showing, across all of the countries, substantial, often majority, shares of the commercial alcohol market are consumed in harmful (very heavy) drinking occasions have implications for alcohol industry claims that they are legitimate partners in the efforts to reduce alcohol harm. The reliance of the transnational alcohol corporations on sales and therefore profits related to heavy/harmful drinking occasions underpins the conflict of interest seen in the subversion by the alcohol industry of effective policy [40] and the promotion of ineffective interventions [1]. The framing promulgated by the transnational alcohol producers and their organisations that there are shared interests with public health and they can engage as partners in alcohol policy development and implementation is contradicted by this evidence. The responsibility of the industry to their shareholders is to protect and maintain their profits. The reliance for their profits on harmful consumption militates against their support of effective programmes and policies and clearly argues for their exclusion from the alcohol policy space.

Limitations of this study include the low response rates in some of the high-income countries (Australia, England and Scotland), which may lead to the possibility that fewer harmful drinkers were included in the study from those countries. However, the coverage of the alcohol available for consumption in those countries, where analysis has been possible, was high (86–90%) [16,17]. In addition, while the sampling frames and mode of interviewing used in each country differed, this was necessary to ensure that the sampling frame was adapted to each country context and provided representative samples, the survey itself remained as consistent as possible across countries. While the data is referred to by the name of the country the sample comes from not all are nationally representative. A further limitation includes the self-report style of the survey. While self-report data could lead to biases such as under-reporting of alcohol consumption, Babor *et al.* [41] have shown that self-report data are just as, or more, accurate as data that has been collected using other means (e.g. biochemical measures). Respondents were asked about their 'typical' consumption across 'usual occasions' by location over the

last 6 months. It is possible that by using 'typical' quantity and frequency of drinking, consumption, particularly irregular harmful drinking, may be underestimated in this survey [42], It is possible that the proportion of alcohol consumed in harmful drinking occasions is in fact larger than that reported in this study.

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